RESPONSIVENESS SUMMARY
GRIFFITH ENERGY, LLC
ELECTRICAL GENERATING FACILITY
AIR QUALITY CONTROL PERMIT NUMBER 1000940

Griffith Energy, LLC has applied for a permit to operate an electrical generating facility located approximately nine miles southeast of Kingman in Mohave County, Arizona. The process at the facility will include:

- Two Westinghouse 501F combustion turbine generator units (CTGs) or equivalent F Class CTGs with dry low-NO_x combustors
- Two heat recovery steam generators (HRSGs) with supplemental duct firing
- One steam turbine generator unit
- Two selective catalytic reduction (SCR) systems for controlling NO_x

The support processes at this facility will consist of the following equipment:

- One auxiliary boiler
- One 8-cell cooling tower for the steam turbine condenser and equipment cooling
- One 6-cell cooling tower for the CTG chiller
- One emergency diesel fire pump
- Main transformers
- Other ancillary equipment

The turbine generators and auxiliary boiler will be powered by natural gas. The purpose of the auxiliary boiler is to maintain steam turbine temperatures during periods of steam turbine shut downs, and to provide heat or steam to other processes when required.

The combustion turbine compresses chilled air which is mixed with natural gas and burned in the dry low-NO_x combustors. The resulting high temperature gases pass through the power turbine and exhaust to the Heat Recovery Steam Generators (HRSGs). The power turbine drives both the compressor and the generator. The generators on each CTG are capable of producing 183 MW. The combustion gases are treated with an SCR system to further control NO_x emissions before being exhausted to the atmosphere.

The HRSGs are boilers which generate steam from the heat in the CTG exhaust gases. To increase overall output from the facility, supplemental (duct) firing of natural gas in the HRSGs may be performed to further increase the temperature of the CTG exhaust gases so that additional steam can be produced for the steam turbine generator (STG). The STG is capable of generating 300 MW.

Low pressure, low temperature steam exhausted from the STG is condensed in the main condenser. The condensate is recycled for use in generating more steam. The condenser is cooled by the circulating water system which rejects waste heat to the atmosphere by evaporation in the cooling tower.

The Griffith Energy facility will burn only natural gas, at a maximum rate of approximately 44,000 million standard cubic feet per year (MMscf/year). Emissions provided by the applicant are for 24-hour per day and 365 days per year of operating time for all equipment, and are presented in Table 1. Griffith Energy has not made a final selection of equipment as of this technical review. Therefore, the applicant has assumed maximum heat input and equipment with the highest level of emission rates anticipated to insure that future compliance will be achieved when final equipment selection is made.

Table 1 - Summary of Controlled Emissions

Pollutants	PM	NOx	CO	SOx	VOCs
Emissions, pounds/day					
Total	63.9	60.7	199	11.5	70.9
Annual Emissions, tons/year					
Total	280	266	872	50.2	310

The Arizona Department of Environmental Quality (ADEQ) has reviewed the effect of the air pollutants emitted by the equipment. Based on the analysis, ADEQ prepared a draft permit (1000940) and the proposed permit was advertised for public review and public hearing. The first advertisement appeared in the Kingman Daily Miner and the Mohave Valley Daily News on May 24, 1999, and the second appeared on May 31, 1999.

ADEQ held the Public Meeting on June 17, 1999 at the Kingman High School - North Campus, 4182 North Bank Street, Kingman, Arizona and the Public Hearing on June 24, 1999 at Hualapai Elementary School, 350 Eastern Avenue, Kingman, Arizona. During the public comment period, which closed June 29, 1999, comments, questions, and objections were received by the ADEQ in both verbal and written format.

This SUMMARY presents the Department responses to issues raised during the review period.

Comment: The ADEQ regulations will not prevent the air in the Kingman area from becoming like the air in southern California.

Response: The National Ambient Air Quality Standards (NAAQS) are the standards set by the United States Environmental Protection Agency (USEPA) for the maximum levels of air pollutants which can exist in the outdoor air without effects on human health or the public welfare and include a margin of safety to protect sensitive people. The federal Clean Air Act requires that the USEPA establish NAAQS and reassess, at least every five years, whether adopted standards are adequate to protect public health based on current scientific evidence. USEPA is required to rely on the advice of an independent scientific panel, the Clean Air Scientific Advisory Committee.

Air quality in the Kingman area currently meets all NAAQS. The Prevention of Significant Deterioration (PSD) program prevents new major sources, such as Griffith Energy, or major modifications to existing major sources, from "deteriorating" the regional ambient air quality beyond a limited amount (or "increment"). In addition, a thorough review and analysis of the proposed

project ensures that the best available control technologies (BACT) are used. As other PSD sources are permitted, each must limit its impact on ambient air quality so as not to exceed the remaining increment. Once the full increment is consumed in an area, no further sources are permitted until emissions in the area are reduced. The increment cap ensures that the area will not exceed the air quality standards and that regional ambient air quality will not be impaired. In the Kingman area, even if the available increments for each subject pollutant were used up, the area would still have air quality that meets the NAAQS.

Table 2. National Ambient Air Quality Standards (NAAQS) Analysis

Pollutant	Period	Predicted Maximum Concentrations		Background Values[2] ($\mu g/m^3$)	Sum of Griffith, Nearby Sources[1] and Background[2] ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
		Griffith Project ($\mu g/m^3$)	Griffith Plus Other Nearby Sources[1] ($\mu g/m^3$)			
PM_{10}	Annual	1.66	1.66	12	13.66	50 (mean)
	24 hr	19.22	19.22	44.8	64.02	150 (mean)
SO_2	Annual	0.41	0.41	Modeled	0.41	80 (mean)
	24 hr	3.92	4.14	Modeled	4.14	365 (max)
	3 hr	7.99	20.14	Modeled	20.14	1300 (max)
CO	8 hr	100.4	136.97	Modeled	636.97	10000 (max)
	1 hr	561.61	1828.33	Modeled	1823.33	40000 (max)
NO_2	Annual	10.42	10.85	Modeled	10.85	100 (max)

Table 3. PSD Class II Increment Analysis

Pollutant	Period	Predicted Maximum Concentrations		Allowable Class II Increment ($\mu g/m^3$)
		Griffith Project ($\mu g/m^3$)	Griffith Plus Other Nearby Sources[1] ($\mu g/m^3$)	
PM_{10}	Annual	1.66	1.66	17 (mean)
	24 hr	19.22	19.22	30 (max)
SO_2	Annual	0.41	0.41	20 (mean)
	24 hr	3.92	4.14	91 (max)
	3 hr	7.99	20.14	512 (max)
CO	8 hr	100.4	136.97	NA
	1 hr	561.61	1828.33	NA
NO_2	Annual	10.42	10.85	25 (mean)

[1] Other nearby sources are: North Star Steel, Mojave Pipeline Operating Company - Topock Compressor Station, Ford Proving Grounds, El Paso Natural Gas Company at Dutch Flats, South Point Power Plant, and Guardian Fiberglass Inc.

[2] PM_{10} background data was obtained from Praxair Inc., located approximately two miles south of the Griffith facility. The highest annual average of 12.00 $\mu g/m^3$, from 1993-1996 monitored data, was used as the background value. The highest 24-hour values from 1993-1996 monitored data were evaluated. Of these four years, the second highest-high of 44.80 $\mu g/m^3$ from 1993 was used as the background value. In lieu of monitored background, values for SO_2, CO and NO_2 were obtained by modeling all nearby sources.

Tables 2 and 3 list the maximum concentration for Griffith and nearby sources. As these Tables show, after considering all the existing sources plus emissions from Griffith, air quality in the Kingman area will remain healthful.

Minor sources and major sources that do not trigger PSD are subject to meeting the NAAQS, but not the PSD increments. The contributions from these sources would only be analyzed on a cumulative basis if a proposed PSD source were located within the impact area.

Comment: What assurances are there that the experience with North Star Steel will not be repeated with Griffith Energy?

Response: The North Star Steel (NSS) facility in Kingman received its installation permit, as a minor source from ADEQ, in 1993. In its original permit application, NSS had relied on a new type of steel production technology (steel mini mill with a shaft furnace) and innovative air pollution controls that did not, in fact, deliver the emissions reductions that had been proposed before the plant began operating in 1996. Since the plant began construction, ADEQ has conducted 28 inspections of the NSS facility. Many of them led to ADEQ's determination, in 1997, that the facility was not a minor source of air pollution. The company applied for a major source permit, and ADEQ is currently developing a permit, while the previous emissions remain under active investigation.

In comparison to NSS, Griffith Energy applied for a major source permit to begin with. Griffith's application has been thoroughly reviewed by ADEQ and USEPA, Region IX, and meets the requirements of PSD program (BACT, increases in ambient air concentrations, and impacts to other air quality related values, etc.). Griffith is planning to use a proven industrial process and air pollution control technologies. In addition, dozens of facilities similar to Griffith's proposed facility have been permitted, constructed and are operating in compliance with environmental laws all across the United States, evidence that the proposed Griffith facility will also operate in compliance with all the terms and conditions of its air quality control permit.

Comment: Everybody is so deeply concerned with the effect of air pollution in the Grand Canyon. The air quality in Golden Valley should be protected to the same degree as it is in the Grand Canyon.

Response: The PSD program provides three area classifications for States to address local land use goals. Each classification permits a different level of growth before the airshed would be considered degraded. Class I areas have the smallest increments, thereby allowing the least air quality deterioration. Class II areas have been designed to accommodate normal, well-managed industrial growth. Class III areas would allow even more growth than Class II areas.

The Kingman area is designated as Class II; therefore, the Griffith project was required to meet the NAAQS, meet the PSD Class II increments, perform a Class I analysis on the Grand Canyon, and perform an additional impacts analysis. The modeling analysis demonstrated compliance with all applicable standards.

Comment: How toxic is the waste water to be stored in the brine pool? What is the chance these chemicals will be emitted into the air?

Response: The waste water primarily contains salt with a total dissolved solids concentration about two-thirds of that of sea water. The only substances from the pool emitted to the air will be water vapor. The dissolved substances will remain in the pool.

Comment: The proposed plant claims its emissions will be within government standards. How can anyone be sure of this until the plant actually begins operation?

Response: Griffith applied for a major source permit. Griffith's permit application has been thoroughly reviewed by ADEQ and USEPA, Region IX, and meets all the requirements of the PSD program (BACT, increases in ambient air concentrations, impacts on other air quality related values, etc.). Griffith is planning to use a proven industrial process and air pollution control technologies. In addition, dozens of facilities similar to Griffith's proposed facility have been permitted, constructed and are operating in compliance with environmental laws all across the United States, evidence that the proposed Griffith facility will also operate in compliance with all the terms and conditions of its air quality control permit.

Comment: The cumulative effect of the proposed Griffith plant and existing sources such as North Star Steel, Praxair, the Mohave Generating Station, semi-tractor-trailer traffic on Interstate 40, and the pollution from California's Los Angeles area must all be considered when determining whether or not to issue this proposed permit.

Response: The PSD modeling included a cumulative impact analysis of all sources within the radius of impact. The regulatory agency responsible for permitting the facility may expand the source's impact area by a maximum of 50 kilometers. ADEQ added 50 km to Griffith's 14 km impact area, which resulted in a 64 km radius impact area. As a result, the Griffith modeling analysis included the contributions from all sources of PM_{10}, SO_2, and NO_2 within 64 kilometers of the source that ADEQ had determined were appropriate. Contributions from traffic on the segment of I-40 from Kingman to Yucca were included. Because the Mohave Generating station was outside of the radius, it was considered part of the baseline concentrations, and was excluded from the modeling analysis. Although outside of the 64 km impact area, contributions from the Topock Compressor Station were also modeled.

Cumulative impacts from North Star Steel, Mojave Pipeline Operating Company - Topock Compressor Station, Ford Proving Grounds, El Paso Natural Gas Company at Dutch Flats, Calpine (South Point) Generating Station, and Guardian Fiberglass Inc. and other local sources were accounted for in the modeling analysis. Some of these facilities were located in other cities. Impacts at the Grand Canyon from other states are accounted for in the regional haze analysis. Visibility degradation resulting from the cumulative impacts of Griffith and the other modeled sources at the Grand Canyon National Park must meet values determined by the Federal Land

Managers (FLM) and the National Park Service (NPS). The FLMs review and double check the data to ensure that the visibility would not be degraded from contributions attributable to Griffith.

PM_{10} has been monitored since 1993 at the Praxair Facility approximately 2 miles south of the proposed Griffith Energy Facility. The highest annual average of 12.00 $\mu g/m^3$, from 1993-1996 monitored data, was used as the background value. The highest 24-hour values from 1993-1996 monitored data were evaluated. Of these four years, the second highest-high of 44.80 $\mu g/m^3$ from 1993 was used as the background value. In lieu of monitored background, values for SO_2, CO and NO_2 were obtained by modeling all nearby sources.

For the NO_2, CO, and SO_2 NAAQS background concentrations, all existing NO_x and CO sources within 20 km of the Griffith Project were included with the proposed sources in the dispersion modeling analysis. The 20 km was based upon the radius of impact (14 km) extended to the crest of the Black Mountains to the west southwest, and the Hualapai Mountains to the east northeast.

Maximum emission rates were modeled as steady state emissions for continuous operation, 24 hours a day, 365 days a year, which equates 8,760 hours per year. As discussed earlier and shown in Tables 2 and 3, the analysis indicate that no NAAQS, Arizona Ambient Air Quality Guidelines (AAAQG), Class I or Class II increment would be violated by the Griffith facility.

Comment: Because of the area's high winds, the County Manager has expressed concern about wind shear when considering multistory county buildings. Will wind shear cause problems for the proposed plant's tall emission stacks?

Response: Changes in wind speed and wind direction occur on a normal basis at varying heights in the atmosphere. Unstable conditions such as those related to a thunderstorm can increase these variations. The modeling reflects 18 months of meteorology collected at the Ford Motor Proving Grounds which was determined to be representative of the Sacramento Valley. The model accounted for any high winds occurring during this time frame, which would have affected the plume rise.

Downwash results when wind blowing around a building creates mechanical turbulence and zones of turbulent eddies. The modeling analysis represents impacts from downwash when downwash resulted in the highest concentrations. Based upon the stack configuration of the Griffith Energy Project, no wind shear effects will occur, as supported by the modeling analysis.

Comment: Will there be any impacts on the water table or water supply in the Kingman area?

Response: The Air Quality Division (AQD) has reviewed the air quality impacts from the facility. The water table and water supply are not within the jurisdiction of AQD. Griffith is required to obtain an Aquifer Protection Permit (APP) from the Water Quality Division of the ADEQ, which will ensure that the brine disposal pond at the facility meets proper engineering standards and protects the

aquifer from pollution. However, laws in the State of Arizona do not give ADEQ any authority to judge or regulate the quantity of water pumped from the aquifer.

Comment: Why were alternative sources of energy, such as solar energy, not considered for this project?

Response: The ADEQ does not have jurisdiction over this issue.

Comment: The electrical power generated at the proposed Griffith site will not be used in Kingman. If so, then why should Griffith be allowed to build its facility in Kingman?

Response: The ADEQ does not have jurisdiction over this issue.

Comment: The proposed Griffith facility will create 25 or fewer new jobs. That does not warrant polluting the area.

Response: The ADEQ does not have jurisdiction over this issue.

Comment: The emissions from the proposed Griffith plant will have an adverse effect on visibility. This will detract from the natural beauty of the area.

Response: A Class I analysis is required of any new major source or modification within 100 km of a Class I area. The Grand Canyon is the only Class I area in the modeling region. Class I analyses consist of Class I PSD increment and NAAQS analyses and air quality-related values (AQRVs) which include visibility, flora, fauna, etc., analyses to ensure that Class I areas are not adversely affected by the proposed emissions.

The applicant performed initial visibility impairment analyses at Class I areas using output from both ISCST3 and CALPUFF models and methods outlined in the Interagency Workgroup on Air Quality Modeling Phase 1 Report, June, 1993. Analyses for Class II areas was performed using EPA approved methods utilizing a Level I screening procedure and the VISCREEN model.

The initial screening analysis at the Grand Canyon indicated the possibility of significant impacts. As a result, a CALPUFF refined modeling assessment was performed. The screening mode of the CALPUFF modeling system predicted a maximum change in extinction coefficient at the Grand Canyon of 3.03 percent, which is within the five percent limit of acceptable change. This result should be considered conservative, because it was based on combustion turbine NO_x emissions of 4.5 parts per million by volume (ppmv), instead of the final permitted emission limit of 3.0 ppmv. The modeling results at the Grand Canyon suggest that the project will also not adversely affect the Lake Mead National Recreation Area, a Class II area 40 kilometers west of the project.

Three Class II areas are close to the project site: Wabayuma Wilderness (eight kilometers), Warm Springs Wilderness (seven kilometers), and Mt. Nutt Wilderness (13 kilometers). Based on the analysis, it was estimated that the visibility may be impaired as follows: Wabayuma Wilderness (10.9 percent of the year), Warm Springs Wilderness (8.9 percent of the year), and

the Mt. Nutt Wilderness (11.3 percent of the year). These results should be considered conservative, because they were based on combustion turbine NO_x emissions of 4.5 ppmv, instead of the final permitted emission limit of 3.0 ppmv. Based upon the modeling analysis and the reduced NO_x emissions, visibility impacts should be within acceptable limits as determined by the FLMs.

Comment: The prevailing wind direction given in the Griffith Energy Project Draft Environmental Impact Statement is wrong. The prevailing wind in the summer blows from the south to the north. This will drive the pollution up into Golden Valley where it will be trapped. The prevailing wind in the winter blows from north to south.

Response: The representativeness of the Ford Proving Grounds meteorological data to the Griffith site was analyzed in detail by ADEQ before allowing Griffith to use the data in their modeling analysis. Both the Griffith site and the Ford Proving Grounds site are located in the Sacramento Valley, and are subject to the same northwest-southeast wind influence created by the local terrain. However, the questions of the predominant wind direction shown in the windrose in the application is a valid one.

A windrose depicts the frequency of wind speed and wind direction for a given time frame. Use of one windrose to represent 18 months of data overshadowed the seasonal variations that exist in the data set. In hindsight, ADEQ should have had the applicant include all 18 monthly windroses in the application. Although the windrose "masks" seasonal variations, the actual data set used in the modeling analysis uses all of the hourly, daily, monthly and seasonal variations in the meteorology that were addressed in the comments.

ADEQ analyzed monthly wind roses for all eighteen months of the Ford Motor Proving Grounds meteorological data. The windrose was generated from 18 months of hourly data from September 1, 1996 to February 28, 1998. The second winter (September 1997 - February 1998) skewed the windrose towards fall/winter conditions. Because the fall/winter wind direction is predominantly from the northwest, the resulting windrose has an apparent northwest/north-northwest predominant wind direction. As a result, the wind rose gave the false impression that the analysis was dominated by northwesterly winds, which could have missed any impacts in Golden Valley and other areas.

ADEQ's approved use of the Ford Proving Grounds with the condition that the full data set be used, even with the potential for a directional bias for the annual impact analysis. The long-term concentration would not be reduced by the additional data, while the decision to use the longest, continuous time period of meteorological data available increased the likelihood that the highest short-term concentration would be predicted (i.e., 24-hour PM_{10}, 1- and 8-hr CO, and 3- and 24-hr SO_2).

Other meteorological data sets exist in the vicinity of the Griffith site and were considered for representativeness. Meteorological data for McConnico and Kingman differ entirely from the Ford Motor Proving Grounds. McConnico has a north-northeast, south-southwest wind pattern due in part to the proximity to the Hualapai mountains and the I-40 pass. The Kingman Airport has a

predominantly southwest flow. Golden Valley may be subject to influences from the mountains that may generate a southerly flow. The Ford Motor Proving Grounds data, even with the proximity to the southern boundary of the Black Mountains are characteristic of the up and down valley winds of the Sacramento Valley.

Comment: Will emissions of formaldehyde be harmful to people or the environment?

Response: Formaldehyde emissions were modeled for both the one-hour, 24-hour, and annual AAAQG. The AAAQG levels are determined with great care to be protective of public health and the environment. Computer modeling shows offsite concentrations are well below the AAAQG for formaldehyde.

Comment: They said the proposed plant emitted formaldehyde in too high of a concentration, but after changing the formula used to calculate this emission, found the plant was within acceptable limits. I question this new formula and its accuracy.

Response: The emission factor initially used to calculate formaldehyde emissions from the facility was based on an EPA published value (*Compilation of Air Pollutant Emission Factors, AP-42, Vol. I, October, 1997*) for a combustion turbine that used selective catalytic reduction (SCR) and water injection to lower the exhaust concentration of NOx. The CTGs proposed by the applicant are a more advanced design and use dry low NOx combustors with SCR to control NOx, without the need for water injection. A more current emission factor for combustion turbines was obtained from *CATEF,* a data base of information developed by the State of California. CATEF contains approximately 2000 air toxics emission factors calculated from source test data from California's Air Toxics Hot Spots Program and is available on the Internet at *http://www.arb.ca.gov/emisinv/catef/catef.htm*. There were seven turbines tested that were classified as cogeneration turbines, fired with natural gas and controlled with SCR. Of the resulting formaldehyde emission factors for the seven turbines tested, Griffith used the largest emission factor to estimate formaldehyde emissions from its facility.

Comment: ADEQ should require Griffith Power to use baghouses, scrubbers, and other devices to reduce pollution emissions from the proposed plant.

Response: The USEPA has provided guidance for conducting top-down BACT analysis in its New Source Review Workshop Manual dated October, 1990. The guidance provides that BACT analyses should be conducted for certain regulated pollutants, for each emission unit, and each pollutant. The top-down process involves listing all available control technologies in descending order of control effectiveness. The PSD applicant is required to first examine the most stringent or "top" alternative. The "top" alternative is established as BACT unless the applicant, such as Griffith, demonstrates, and the permitting authority, such as ADEQ, in its informed judgment agrees, that technical considerations, or energy, environmental or economic impacts justify a conclusion that the most

stringent control technology is not achievable in that case. If the most stringent technology is eliminated in this fashion, then the next most stringent alternative is considered, and so on.

BACT analyses were performed for Griffith. As a result of the BACT analyses, Griffith will employ Low NOx burners for combustion and selective catalytic reduction as a post-combustion control device to minimize emission of NOx from the combustion turbine generators (CTG). Likewise, Low NOx burners and flue gas recirculation as methods to minimize the emission of NOx from the auxiliary boiler. Baghouses or particulate scrubbers were not considered essential for Griffith's processes because natural gas fuel contains only trace amounts of solid matter and the plant would prefilter both the fuel and the air before sending it to the comubstors.

Tables 4 through 6 show BACT analysis for CTGs, for NOx, CO and PM10. Tables 7 and 8 show BACT analysis for auxiliary boiler, for NOx and CO.

Table 4: CTG/HRSG BACT Comparison for NO_x

Facility	Process	Control Technology	Emiss. Limit	Emiss. Limit Unit	Cntrl. Eff.	Tons Controlled	Cost ($)	$/ton Controlled
Griffith	CTG/HRSG	SCONOx	2.5	ppmv	90	968.7	5393000	5567
Griffith	CTG/HRSG	SCR/Oxidation Catalyst	2.5	ppmv	90	968.7	2059000	2126
Griffith	CTG/HRSG	SCR	2.5	ppmv	90	968.7	1534000	1584
Griffith	CTG/HRSG	SCR	3	ppmv	88	947.8	1461000	1541
Griffith	CTG/HRSG	SCR	3.5	ppmv	86	926.9	1398000	1508
Griffith	CTG/HRSG	SCR	4	ppmv	84	906.1	1339000	1478
Griffith	CTG/HRSG	SCR	4.5	ppmv	82	885.2	1282000	1448
Griffith	CTG/HRSG	SCR	9	ppmv	65	697.3	1017000	1459
Calpine (unofficial; not in RBLC)	CTG/HRSG	SCR	3	ppmv		1663	1756000	1062
Brooklyn Navy Yard Cogen	Natural Gas Turbine	SCR	3.5	ppmv				
Blue Mountain Power	CTG/HRSG	SCR, Dry Low NOx Burner	4	ppmv	84			
Sithe/Independence Power Partners	Natural Gas Turbines	SCR, Dry Low NOx Burner	4.5	ppmv				
Portland Gen Electric	Natural Gas Turbines	SCR	4.5	ppmv	82			8537
Hermiston Generating	Natural Gas Turbines	SCR	4.5	ppmv	82			
Southern California Gas	Natural Gas Turbine	SCR	8	ppmv	93			
Newark Bay Cogen	Natural Gas Turbines	SCR	8.3	ppmv				
UNOCAL	Natural Gas Turbine	SCR, Water Injection	9	ppmv	80			
Mid-Georgia Cogen	Natural Gas Turbines	SCR, Dry Low NOx Burner	9	ppmv				
Formosa Plastics	CTG/HRSG	Dry Low NOx Burner, Combustion Design & Control	9	ppmv				181
Milagro, Williams Field Service	Natural Gas Turbines	Dry Low NOx Burner	9	ppmv	94			
Saranac Energy	Natural Gas Turbines	SCR	9	ppmv				
Selkirk Cogen	Natural Gas Turbines	SCR, Steam Injection	9	ppmv				
PASNY/Holtsville Combined Cycle	Natural Gas Turbine	Dry Low NOx Burner	9	ppmv				
Narragansett Electric/NE Power	Natural Gas Turbine	SCR	9	ppmv				

Table 5: CTG/HRSG BACT Comparison for CO

Facility	Process	Control Technology	Emiss. Limit	Emiss. Limit Unit	Cntrl Eff	Tons Controlled	Cost ($)	$/ton Controlled
Griffith	CTG/HRSG	SCONOx w/Duct Burner	2	ppmv	88	383.8	5393000	14052
Griffith	CTG/HRSG	SCR/Oxidation Catalyst w/Duct Burner	3	ppmv	82	355.7	630000	1771
Griffith	CTG/HRSG	Combustion Controls w/Duct Burner	20	ppmv				
Griffith	CTG	Combustion Controls w/out Duct Burner	20	ppmv				
Calpine (unofficial; not in RBLC)	CTG	Combustion Controls w/out Duct Burner	10	ppmv				
Calpine (unofficial; not in RBLC)	CTG/HRSG	Combustion Controls w/Duct Burner	35	ppmv				
Newark Bay Cogen	Natural Gas Turbines	Oxidation Catalyst	1.8	ppmv				
Saranac Energy	Natural Gas Turbines	Oxidation Catalyst	3	ppmv				
Blue Mountain Power	CTG/HRSG	Oxidation Catalyst	3.1	ppmv	80			
Brooklyn Navy Yard Cogen	Natural Gas Turbine	Combustion Controls	4	ppmv				
PASNY/Holtsville Combined Cycle	Natural Gas Turbine	Combustion Controls	8.5	ppmv				
Selkirk Cogen	Natural Gas Turbines	Combustion Controls	10	ppmv				
Unocal	Natural Gas Turbine	Oxidation Catalyst	10	ppmv	75			
Orlando Utilities Commission	Natural Gas Turbines	Combustion Controls	10	ppmv				
Mid-Georgia Cogen	Natural Gas Turbines	Complete Combustion	10	ppmv				
Narragansett Electric/NE Power	Natural Gas Turbine		11	ppmv				
Sithe/Independence Power Partners	Natural Gas Turbines	Combustion Controls	13	ppmv				
Portland General Electric	Natural Gas Turbines	Good Combustion Practices	15	ppmv				
Hermiston Generating	Natural Gas Turbines	Good Combustion Practices	15	ppmv				
Auburndale Power Partners	Natural Gas Turbine	Good Combustion Practices	15	ppmv				

Table 6: CTG/HRSG BACT Comparison for PM

Facility	Process	Control Technology	Emiss. Limit	Emiss. Limit Unit	Cntrl Eff.	$/ton Controlled
Griffith	CTG/HRSG	Combustion Controls w/Duct Burner	0.012	lb/MMBtu		
Griffith	CTG	Combustion Controls w/out Duct Burner	0.0097	lb/MMBtu		
Calpine (unofficial; not in RBLC)	CTG/HRSG	Combustion Controls w/Duct Burner	22.8	lb/hr		
Calpine (unofficial; not in RBLC)	CTG	Combustion Controls w/out Duct Burner	18.3	lb/hr		
Narragansett Electric/NE Power	CTG/HRSG		0.005	lb/MMBtu		
Newark Bay Cogen	Natural Gas Turbines	Turbine Design	0.006	lb/MMBtu		
Saranac Energy Company	Natural Gas Turbines	Combustion Controls	0.0062	lb/MMBtu		
Hartwell Energy	Natural Gas Turbines	Clean Burning Fuels	0.0064	lb/MMBtu		
Kamine/Besicorp Syracuse	Natural Gas Turbine	Sulfur Content Not to Exceed 0.15% by Weight	0.008	lb/MMBtu		
Tempo Plastics	Natural Gas Turbine	Lube Oil Vent Coalescer	0.012	lb/MMBtu		
Auburndale Power Partners	Natural Gas Turbine	Good Combustion Practices	0.0136	lb/MMBtu		
TBG Cogen	Natural Gas Turbine	Sulfur Content Not to Exceed 0.037% by Weight	0.024	lb/MMBtu		
Megan-Racine Associates	Natural Gas Turbine	No Controls	0.028	lb/MMBtu		
CNG Transmission	Natural Gas Turbine	Use of Natural Gas	0.035	lb/MMBtu		
Casco Ray Energy	Natural Gas Turbines		0.06	lb/MMBtu		

Table 7: Auxiliary Boiler BACT Comparison for NO_x

Facility	Process	Control Technology	Emiss. Limit	Emiss. Limit Unit	Cntrl Eff	Tons Controlled	Cost ($)	$/ton Controlled
Griffith	Natural Gas Aux. Boiler	Flue Gas Recirculation and Low-Nox Burners	0.092	lb/MMBtu				
Kalamazoo Power Limited	Natural Gas Backup Boiler		0.02	lb/MMBtu				
Kamine/Beiscorp Syracuse	Utility Boiler	Flue Gas Recirculation	0.035	lb/MMBtu	70.9			
Sunland Refinery	Boilers	Flue Gas Recirculation and Low-Nox Burners	0.036	lb/MMBtu				
Newark Bay Cogen	Natural Gas Aux. Boiler	Flue Gas Recirculation and Low-Nox Burners	0.05	lb/MMBtu	75			
Newark Bay Cogen	Natural Gas Aux. Boiler	Flue Gas Recirculation and Low-Nox Burners	0.05	lb/MMBtu				
Champion International	Natural Gas Boiler	Flue Gas Recirculation	0.05	lb/MMBtu				
I/N Kote	Package Boiler	Flue Gas Recirculation and Use of Natural Gas	0.05	lb/MMBtu				
Grain Processing	Boilers	Flue Gas Recirculation and Low-Nox Burners	0.05	lb/MMBtu				
Anitec Cogen	Auxiliary Boiler	No Controls	0.05	lb/MMBtu				
James River	Boiler	Flue Gas Recirculation and Low-Nox Burners	0.06	lb/MMBtu	70			
Indelk Energy Services Ostego	Natural Gas Boiler	Flue Gas Recirculation	0.06	lb/MMBtu	40			
American Crystal Sugar	Natural Gas Boiler	Flue Gas Recirculation and Low-Nox Burners	0.075	lb/MMBtu				
Milagro Williams Field Service	Boiler	Flue Gas Recirculation and Low-Nox Burners	0.08	lb/MMBtu	77			
IMC-Agrico Faustina	Utility Boiler	Low-Nox Burners	0.08	lb/MMBtu				170

Table 8: Auxiliary Boiler BACT Comparison for CO

Facility	Process	Control Technology	Emiss. Limit	Emiss. Limit Unit	Cntrl Eff	Tons Controlled	Cost ($)	$/ton Controlled
Griffith	Natural Gas Aux. Boiler	Good Combustion Practices	0.055	lb/MMBtu				
Kalamazoo Power Limited	Natural Gas Backup Boiler		0.003	lb/MMBtu				
Kamine/Beiscorp Syracuse	Utility Boiler	No Controls	0.038	lb/MMBtu				
Indeck-Yerkes Energy Services	Natural Gas Aux. Boiler	No Controls	0.038	lb/MMBtu				
Newark Bay Cogen	Natural Gas Aux. Boiler	Boiler Design	0.04	lb/MMBtu				
Grain Processing	Boilers	Good Combustion Practices	0.04	lb/MMBtu				
Indeck Energy	Natural Gas Aux. Boiler	No Controls	0.042	lb/MMBtu				
Lakewood Cogen	Natural Gas Boiler	Boiler Design	0.042	lb/MMBtu				
Mid-Georgia Cogen	Natural Gas Boiler	Complete Combustion	0.05	lb/MMBtu				

Comment: If the proposed plant can be made cleaner, then ADEQ should require that.

Response: Griffith Energy was required to perform an analysis and show that it would install, maintain and operate the best available control technologies to reduce air pollution for CO, NOx, SO_2 and PM_{10}, to meet all requirements of the PSD program.

Comment: Nothing in the permit says that ADEQ can shut down Griffith Power if the plant is over the emissions limit.

Response: When an industrial source of air pollution, such as Griffith, exceeds the emissions limits of its permit, it has to follow a set of procedures outlined in its air pollution control permit, under the "Reporting of excess emissions, permit deviations and emergencies" section of Attachment "A". For any excess emissions or permit deviations that can not be corrected within 72 hours of their occurrence, the sources are required to submit a compliance schedule of remedial measures to ADEQ within 21 days of such occurrences. The compliance schedules typically include a schedule of remedial measures, including an enforceable sequence of actions with milestones, leading to compliance with the permit terms and conditions that have been violated. These conditions are also present in Griffith's permit.

Comment: What assurance is there that this permit has not already been approved in a “back room deal?”

Response: According to Arizona Revised Statute (A.R.S.) §49-426.A, permits are issued by the director of ADEQ, and according to A.R.S. §49-426.D, the department shall consider and prepare written responses to all comments made at a public hearing conducted by the department. A.R.S. §49-426.D further requires that the written responses be made available to the applicant and any person who commented on the proposed permit at the time a final permit decision is made. The director is fulfilling her duties as mandated in the A.R.S., and has not made a final permit decision to issue or deny the permit, or entered in an agreement with any entity to make such a decision, prior to the public hearing.

Comment: How will the ADEQ monitor Griffith Energy to ensure the proposed facility is operated in a manner allowable by their permit?

Response: ADEQ will use three methods to ensure that the plant is operating in compliance with its air quality permit. The first method is through initial and periodic third-party emission testing required by the permit. Industrial sources of air pollution, such as Griffith, have requirements for performance testing of pollutants on intervals of time, specified in their respective air pollution control permits. Industrial sources typically hire performance testing companies on a contractual basis to conduct the scheduled performance tests, which are observed by ADEQ inspectors trained in the reference methods used for conducting such tests. Performance testing typically requires putting a probe in the stack to pull a sample of exhaust gases and analyze them for the pollutant(s) required to be measured. In addition, ADEQ has required Griffith

to install continuous emission monitoring systems for continuously measuring the emissions of NOx and CO, which will display the emissions levels of these pollutants, at all times, during operation of the facility.

The second method is through submittal of semi-annual reports and compliance certifications which are required by the permit. These reports and certifications are reviewed by ADEQ staff to assure that the source is in compliance with all applicable requirements. In the case of excess emissions, permit deviations, and emergencies, Griffith is required to report to ADEQ within 24-hours of the occurrence, with a detailed written notification and explanation within 72 hours. Detailed record keeping of monitoring data and support information, such as calibration and maintenance records, and original strip chart recordings must be maintained for 5 years, and are subject to ADEQ inspection and audit.

The third method is through both scheduled and unscheduled, unannounced inspections of the plant and records, which are specifically provided for in the permit.

Citizen complaints are also utilized by ADEQ as help in our compliance efforts. ADEQ has a policy of responding to citizen complaints as soon as possible but no later than five working days of receiving them. Typically, when citizen complaints are received by ADEQ, an inspector conducts a field inspection and also conducts a thorough records review of the facility. Upon completion of the investigation, the inspector contacts the complainants (if they wish to be contacted) and informs them of the result of the investigation. Citizens can list their complaints by calling (800) 234-5677 ext. 4486.

Comment: If the permit has not already been approved and construction can not begin until the permit is approved, then why are roads to the proposed facility being constructed.

Response: Griffith Energy cannot begin construction of their proposed plant until after their air quality control permit application is has been issued to them. However, road construction conducted by Mohave County are not under the jurisdiction of ADEQ.

Comment: According to the application for their permit, they have over 100 tons of particulates, NOx, carbon monoxide, and VOCs for each stack. And they have two stacks. So they are eight times a major polluter.

Response: Air pollution sources are classified into major and minor sources. A major source of air pollution is defined as any stationary source with a potential to emit 100 tons per year of any one air pollutant. Major sources are required to undergo more rigorous modeling prior to obtaining their permit than do minor sources. Major sources are also subject to more extensive pollution controls than are minor sources.

The 100 tons per year threshold is used to determine whether a source is classified as major or minor, but not to determine the extent to which a source is major.

Comment: This is an internal combustion generator. It runs at much higher temperatures. They are gas turbines, not gas fired boilers. And because of that and the high temperatures, they create more of the particulates.

Response: As discussed earlier, Griffith Energy was required to perform (and it did perform) BACT analyses for the three regulated air pollutants by consulting the national clearinghouse for such information, maintained by the USEPA, as a part of the permit application process. Griffith's BACT determinations were evaluated by ADEQ in accordance with the PSD program, and ADEQ has required Griffith to install, maintain and operate the best available control technologies to minimize the air pollutants emitted from this facility.

Comment: It seems that the EPA and the Arizona Department of Environmental Quality do not recognize the huge problem related to the industrial corridor that is being developed by MCEDA, where these components are industries of this corridor are being evaluated on a stand alone basis.

Response: ADEQ reviews permit applications for compliance with all the rules and regulations that apply to these kind of source. In the case of a PSD source, such as Griffith Energy, a cumulative impacts analysis is required. Griffith was required to perform such analysis which was reviewed and approved by ADEQ. This analysis was discussed earlier and shown in Tables 2 and 3. As these tables show, after considering all the existing sources, plus emissions from Griffith, air quality in the Kingman area will remain healthful.

Although ADEQ may grant a permit to an individual source, the zoning and siting decisions for the area in which the source wishes to operate are made by planning and zoning authorities of local government. While ADEQ recognizes the concerns over the industrial corridor under development by MCEDA, our jurisdiction is limited to individual analysis for minor sources and cumulative analysis for PSD sources, with respect to air quality.